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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,913

06/16/2005

Marianne Hammer-Altmann

10191/4139

8406

26646 7590 01/02/2009

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EXAMINER

KOSLOW, CAROL M

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

01/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/539,913	Applicant(s) HAMMER-ALTMANN ET AL.	
	Examiner C. Melissa Koslow	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-15 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-15 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 17 November 2008 has been entered.

The amendments to the claims comply with the requirements of 37 CFR 1.121 (c) and have overcome the 35 USC 112 rejections over claims 9-10, 12, 15-17 and 21 and over claims 11 and 13 with respect to antecedent basis for the phrases "PZT compounds" and "the PZT base material". The objection to the disclosure with respect to "PZT-based" is withdrawn upon reconsideration. It is now understood this phrase means any piezoelectric ceramic containing lead cations, zirconate anions and titanate anions. The amendment to specification has overcome the objection to the misspelling of perovskite. Applicant's arguments with respect to the remaining objections and rejections have been fully considered but they are not persuasive.

The disclosure is objected to because of the following informalities:

The composition of the piezoelectric ceramic is unclear. The phrase "doped" does not clearly define the composition of the ceramic. A PZT can contain rare earth metal as substituents or dopants, such as lead lanthanum zirconate titanates where the dopant is part of crystal structure, or it can contain subcomponents that are not part of the PZT perovskite structure, which are also known as dopants in the art. Applicants need to clarify the composition discussed in the specification. The table on page 6 state RB-doping is doping as in WO 02/55450. The actual doping composition is not disclosed and WO 02/55450 does not define any specific

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composition as RB-doped. Thus the actual composition tested is unclear. Appropriate correction is required.

The amendment to the specification does not overcome the objections. Applicants' arguments do not explain what is meant by "doped" and thus does not clarify the composition of the doped compositions. There is nothing in the inserted subject matter nor in WO 02/55450 to indicate that "RB" refers to the assignee of WO 02/55450 and that the "doping" refers to A^1, A^2, B^1, B^2 and B^3 and the amounts of the additives taught in WO 02/55450. The table in the specification indicates that PZT with RB-doping refers to a single composition, not to all the composition encompassed by the formula in WO 02/55450 as argued. The objections are maintained.

The amendment filed 17 November 2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The added material to the paragraph beginning on page 4, line 4. Applicant is required to cancel the new matter in the reply to this Office Action.

This information is from WO 02/055450, but since this reference was not incorporated by reference and thus any information for that reference inserted into the specification is considered new matter.

Claims 11-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant

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art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no teaching in the originally filed disclosure that the oxide and carbonate starting materials are doped as now claimed. Thus claims 11-15 contains new matter. While the originally filed disclosure teaches adding the dopants to the starting compound mixture, this is not what is being claimed.

Claims 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is meant by “simply doped” in claims 11 and 13. Claim 12 recites the limitation “the rare earth metal”. There is insufficient antecedent basis for this limitation in the claim or in claim 11. Claim 11 teaches rare earth metals.

Applicants’ argument that “simply doped” means the compound is doped with a single rare earth metal. The specification does not clearly support this definition. The section on page 3 says “simply doped with rare earth metals”. The use of the plural “metals” indicates that the material can be simply doped with one or more rare earth metals. It is strongly suggested applicant delete “simply” from claims 11 and 13 to overcome this rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 9-13 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 5,993,895.

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This reference teaches adding a lithium salt to PLZT powder, which is a lanthanum doped PZT ceramic. While the reference does not teach how the PLZT is produced, it is notoriously well known in the art that this material is conventionally produced by mixing oxides of lead, lanthanum, zirconium and titanium and calcining the mixture. Table 1 teaches adding 0.84 and 1 wt% lithium nitrate, which is 0.084 and 0.1 wt% ionic lithium. The reference teaches the claimed process. Since the taught composition and process are identical to that claimed, the taught ceramic must have a sintering temperature in the ranges of claims 9 and 20, absent any showing to the contrary.

Claims 9-13 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,993,895.

This reference teaches adding a lithium salt to PLZT powder, which is a lanthanum doped PZT ceramic. While the reference does not teach how the PLZT is produced, it is notoriously well known in the art that this material is conventionally produced by mixing oxides of lead, lanthanum, zirconium and titanium and calcining the mixture. The lithium salt can be lithium nitrate or lithium carbonate and the amount is 0.5-10 wt%. If the salt is lithium nitrate, the ionic amount of lithium added is 0.05-1 wt% and if the salt is lithium carbonate, then the amount of ionic lithium is 0.095-1.9 wt%. These ranges overlap the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference teaches the composition has a sintering temperature of not greater than 1100°C, which encompasses the claimed range. In addition, since the taught and claimed

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compositions overlap and the taught and claimed processes are the same, one of ordinary skill in the art would expect the taught ceramic to have an overlapping sintering temperature range, absent any showing to the contrary. This reference teaches the ceramic is used to form a multilayered capacitor having internal electrodes. This structure is the same as an actuator and thus the capacitor would also act as an actuator in different applications. While the taught electrodes are composed of silver/palladium alloy, it is well known in the art that silver is a functionally equivalent electrode material that also requires the sintering temperature to be less than 1100°C. Thus it would have been obvious to use a silver electrode in place of the taught alloy. In addition, it would have been obvious to use the taught capacitor/actuator in a motor vehicle fuel injection system since this is a well known use of piezoelectric actuators. The reference suggests the claimed process, actuator and system.

Applicants argue that the taught PLZT is not a PZT based ceramic. As discussed above, since applicants did not explicitly define the term "PZT-based", this term is given its conventional meaning which is any piezoelectric ceramic containing lead, zirconate titanate ions. The taught ceramic meets this definition. Applicants also argued that the taught La is not a dopant, but as discussed above, the term "dopant" can refer to both ions in the crystal structure and thus which are part of the core constitute of the ceramic and to those outside the crystal structure. There is nothing in applicants' specification teaching that the dopant cannot be part of the core constitutes and in fact the dopants in WO 02/055450 are part of the core constitutes of the ceramic. Thus this argument is not convincing. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the amounts of La, Zr and Ti) are not recited in the rejected claims. Although the

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claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). With respect to the sintering temperature, the reference teaches sintering at temperature of not greater than 1100°C, which overlaps that claimed. The fact the examples teach sintering at 1000°C and 1100°C does not mean that it cannot be sintered in the claimed range. Applicants are reminded a reference is not limited to its examples. The claimed range of 850-950 is clearly less than 1100 and thus falls within the taught range. Applicants have not shown that the taught ceramic cannot be sintered in the claimed temperature range. With respect to the method of making the ceramic, as stated above, one of ordinary skill in the art would be expected to know that such ceramics are conventionally made by mixing oxide and carbonates of lead, lanthanum, titanium and zirconium and firing the mixture and that the ceramic in the reference must have been produced by this conventional method. Applicants have not presented any evidence to rebut this. The rejections are maintained.

With respect to the 35 USC 103 rejection arguments, the Examiner addressed the electrode materials different in the rejection. Applicants argue that silver electrode cannot be used in the taught actuator and bases this on the sintering temperature taught in the examples. As discussed above, the reference teaches sintering at temperature of less than 1100°C which encompasses temperatures of less than about 960°C. There has been no showing that the taught ceramic cannot be sintered at the claimed temperature nor that the taught actuator cannot be formed with silver electrodes. The rejection is maintained.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/cmk/
January 2, 2009

/C. Melissa Koslow/
Primary Examiner
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